

CLAIMS

What is claimed is:

- 5 1. A computer fan efficiency feedback method comprising:
receiving an indication electronic components are operating and dissipating
heat;
directing a cooling system to provide air flow to said electronic components;
and
10 modulating speed of a fan in said cooling system in accordance with a fan speed
efficiency control plan.
2. The computer fan efficiency feedback method of Claim 1 wherein said fan speed
efficiency control plan sets guidelines for modulating a fan speed to value that
15 maximizes an efficiency ratio.
3. The computer fan efficiency feedback method of Claim 2 wherein said efficiency
ratio is a ratio of flow work of said fan to input power supplied to said fan.
- 20 4. The computer fan efficiency feedback method of Claim 3 wherein said flow
work is defined as a static pressure delivered by said fan times said fan volumetric
flow rate.
5. The computer fan efficiency feedback method of Claim 1 further comprising
25 overriding said modulating by a temperature reading and setting said fan to a
maximized cooling level.

6. A computer fan efficiency feedback method of Claim 1 further comprising monitoring ambient temperature around said electronic components.

5 7. A computer fan efficiency feedback method of Claim 1 further comprising measuring the temperature of said electronic equipment with a thermal couple device.

8. A computer fan efficiency feedback system comprising:

a bus for communicating information;

10 a processor coupled to said bus, said processor for processing said information;

a memory coupled to said bus, said memory for storing said information; and

a fan cooling system coupled to said bus, said fan cooling system for cooling said temperature of said bus, processor and memory in accordance with an optimized balance of cooling and power consumption.

15 9. A computer fan efficiency feedback system of Claim 8 wherein said fan cooling system comprises a fan and a fan controller, wherein said fan controller controls said fan revolution rate.

20 10. A computer fan efficiency feedback system of Claim 8 wherein said fan cooling system alters the speed of a fan to optimize flow work in relation to power supplied to said fan.

11. A computer fan efficiency feedback system of Claim 8 wherein said flow work
25 is defined as a static pressure delivered by said fan times said fan volumetric flow rate.

12. A computer fan efficiency feedback system of Claim 8 wherein said processor directs said cooling system in accordance with a fan speed efficiency control plan.

13. A computer fan efficiency feedback system of Claim 8 further comprising a temperature measuring system for measuring temperature of said processor and memory.

14. A computer fan efficiency feedback method of Claim 13 further comprising overriding said modulating by a temperature reading and setting said fan to a maximized cooling level.

15. A fan speed efficiency control plan method comprising:
determining flow resistance characteristics of a computer system;
examining the performance of a fan in the absence of flow resistance;
analyzing efficiency of said fan; and
selecting an operation point for said fan at which fan efficiency is optimized and fan speed is minimized.

16. A fan speed efficiency control plan method of Claim 15 wherein determining the resistance characteristics of the system includes analyzing the impact of items in the air flow path on flow resistance.

17. A fan speed efficiency control plan method of Claim 15 wherein analyzing efficiency of said fan includes establishing a ratio of flow work of said fan to input power supplied to said fan.

18. A fan speed efficiency control plan method of Claim 15 further comprising establishing a temperature limit point at which damage to said computer system begins to occur and setting an operating point at a level that prevents said temperature limit from being exceeded.

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19. A fan speed efficiency control plan method of Claim 15 further comprising developing instructions to control said fan operation in accordance with said operating point.

10 20. A fan speed efficiency control plan method of Claim 15 wherein said operating point is an intersection between fan static pressure and system resistance, wherein said intersection defines a volumetric rate said fan is capable of driving through a system.